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**The Direct and Indirect
Costs of Diabetes
in the State of Indiana**

Indiana Diabetes Control Program

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EXECUTIVE SUMMARY

We utilized estimates of health care utilization and expenditures from a national survey (National Medical Care Expenditure Survey, 1987) to estimate the utilization and costs of care associated with diabetes in Indiana State for 1994. Estimates were calculated using the 1994 Indiana population estimates. All medical care expenditure and earning estimates were adjusted to reflect 1994 costs.

We estimate that 136,463 persons had known diabetes in Indiana in 1994. This population represented 4.3 percent of the Indiana State population, but consumed 13% of the estimated health care expenditures. These rates are higher than national averages because the Indiana population profile is older than the national profile. Persons with diabetes were more likely to utilize all forms of medical care. The costs of care for every type of medical care was at least two-fold higher for persons with diabetes as compared to those without diabetes. The mean costs for all medical care was \$10,019 for persons with diabetes compared to \$2950 for those without diabetes. Inpatient care consumed over half of all expenditures.

The majority of medical care costs for persons with diabetes are incurred for complications. Because these conditions also occur in non-diabetic persons, we calculated the costs of these conditions attributable to diabetes. The total costs attributable to diabetes (in millions) was hypertension (\$25), cardiovascular disease (\$59), cerebrovascular disease (\$20), eye disease (\$16), nephropathy (\$6), and diseases of the lower extremity (\$20). This data provides a more accurate estimate of the impact of diabetes on the costs of care, and can be used to inform public policy decisions on the best preventive strategies to employ.

Over one fourth of persons with diabetes were not employed due to illness or disability, compared to 7 percent of the populations. On average, persons with diabetes averaged an earning loss of \$5544 compared to a loss of \$1959 for persons without diabetes. This loss translated into higher rates of assistance from State and Federal sources for medical expenditures.

In summary, diabetes is associated with higher rates of health care utilization of all types and a 3-fold higher per capita cost for medical care. It is associated with high rates of disability, greater loss of earnings, and is associated with higher use of Medicaid and Medicare funds. Public health measures must take both the effectiveness, prevalence, and costs of complications into account when designing interventions to improve the health of its citizens.

Introduction

Although the diagnosed diabetic population comprises only 3.1% of the US population, they have been reported to consume 11.9% of the total US health care expenditures (Rubin, 1994). Per-person expenditures were estimated to be \$11,157 for 1992, which is four times higher than the expenditures for nondiabetic persons. Because of these high costs, better information is needed to assist public policy decisions. In this report, we use national and state-specific data to estimate the direct and indirect costs of diabetes for the State of Indiana.

METHODS

Data Sources

The population estimates for 1994 were obtained from the Indiana State Department of Health. These estimates are based upon the 1990 Census, and were modified to reflect the impact of birth, death, and migration trends for Indiana.

The diabetes prevalence and cost estimates are taken from the 1987 National Medical Expenditure Survey (NMES-2) conducted by the US Public Health Service. This national survey was composed of a survey of the U.S. civilian noninstitutionalized population (Household Survey) and a survey of nursing homes (Institutional Population Component) (Edwards & Berlin, 1989). This is the most recent survey of medical care and nursing home care available and contains extensive information on year-long expenditures. The methods used to collect data on the nursing home population were similar to those used for the general population, allowing comparisons between the populations.

The Household Survey (HS) of the 1987 NMES-2 collected information on health status, health care utilization and expenditures from a sample of the US civilian, noninstitutionalized population (Edwards & Berlin, 1989). When weighted appropriately, this sample reflects the total population of civilian, noninstitutionalized individuals in the United States. Approximately one percent of the civilian, noninstitutionalized population entered a nursing facility during 1987. These individuals are included in the estimates for the general population. The Household Survey used self-administered questionnaires to collect information on chronic conditions, health status, and health habits for all adults. Information on each family member's health care utilization and expenditures were obtained on a quarterly basis from a designated family member.

The companion survey, the Institutional Population Component (IPC) of the 1987 National Medical Expenditure Survey (NMES-2) is the first national survey to obtain full-year information on use and expenditures for persons in nursing facilities. The IPC was based on a national two-stage probability design. The first stage sampled licensed nursing or personal care homes with three or more beds that routinely provided nursing or personal care services. (Cohen et al, 1993). The second stage sampled persons residing one or more nights in a nursing home during 1987. Utilization and expenditure data was collected from January 1 or the date of admission, until the time of death, discharge or December 31, 1987 if still residing

in an eligible facility (Cohen & Potter, 1993). Data were collected from three sources: care-givers in the nursing facility (usually nursing staff who were familiar with the patient and who had access to the medical records); financial records personnel (e.g., billing clerks in the nursing facility with access to the patient billing records); and the next-of-kin residing in the community. Information on demographics, medical conditions, and health status was collected from the care-givers and the next of kin. Information on nursing home utilization was collected from care-givers and the financial records personnel. Expenditures were obtained from the financial records personnel in each nursing facility that the person lived in during 1987 (Edwards & Edwards, 1989).

Definition of Diabetes Status

The number of persons identified as having diabetes is highly sensitive to the way the question is posed. The NMES-2 estimates of persons with diabetes in the general population are about 30% higher than estimates obtained from the National Health Interview Study (NHIS) for 1987 (Schoenborn & Marano, 1988). Both of these surveys are based on national samples, but used slightly different wording in the questionnaires. In the NHIS, the family respondent was asked, "During the past 12 months did anyone in the family {read names} have diabetes?", while the NMES-2 asked each person in a self-administered questionnaire, "Has a doctor ever told you that you have diabetes (high blood sugar)?" This latter inquiry could include persons who had a history of gestational diabetes or impaired glucose tolerance, but had not been diagnosed with diabetes. This change in wording provides a larger estimate of diabetic persons in the general population, creating an ascertainment bias. The NMES-2 estimated 9,553,872 persons reported that they had diagnosed diabetes in 1987, while the 1987 NHIS estimated 6,641,000 persons had diagnosed diabetes. If the definition of diabetes was restricted to anyone who had a medical care visit for a diabetes condition, the NMES-2 estimate of the diabetic population would be 7,681,967 (Rubin et al, 1994). We used this more conservative definition of diabetes for the estimates of diabetes prevalence. While this underestimates the true number of persons with diagnosed diabetes, it accurately reflects the population that is utilizing health care and incurring expenditures. Using persons who utilize health care as the denominator provides a higher estimates of the mean expenditures per diagnosed diabetes, but provides an accurate estimate of the total expenditures for the population.

Definition of Diabetes in the Nursing Home Population

The diabetes status was ascertained in a somewhat different fashion in the IPC. In the IPC, diabetes status was obtained from four different sources. Medical diagnoses were obtained from the medical chart on January 1 for persons residing in a nursing facility on January 1, 1987, and upon admission for those admitted during the year. Diagnoses were obtained again at the time of admission to an acute care hospital during that year or from the nursing facility medical records on December 31, 1987 if the person was still residing in the nursing facility. The diagnoses listed on the resident's medical record were recorded and

coded using the International Classification of Diseases, 9th revision (ICD-9) (US DHHS, 1991). Accordingly, the care-giver for the nursing facility was asked, "According to the patient's medical record, (does/did) the (resident's name) have diabetes?" The next-of-kin was asked, "Did a doctor or other medical person ever say that (resident's name) had diabetes?" The resident was noted to have diabetes if any of these respondents replied affirmatively to the diabetes questions, or if a diagnosis of diabetes (ICD-9 code 250.xx) was noted in the nursing facility records during 1987.

Definitions of Expenditures

All costs are reported as expenditures. Ambulatory visits reflect physician services provided in the ambulatory setting. Outpatient services were defined as any outpatient care, include labs, X-rays, therapy, and procedures obtained as an outpatient other than in the emergency department. All services provided in the emergency department were identified as such. Medications included all medications provided in the outpatient setting. Inpatient costs included the hospital room, medications, operations and other procedures, and physician services.

Data Analyses

The NMES-2 is used to develop prevalence rates for diabetes in each age, sex, race, and urban/rural residence cell. The prevalence rate is then multiplied by the Indiana population estimates to provide estimates of the number of persons with diagnosed diabetes. This estimate does not include individuals that have not yet been diagnosed with diabetes, or those who do not utilize health care. However, this estimate accurately reflects the number of persons who utilize health care and thus incur costs for care.

Estimates of expenditures are provided for diabetic and nondiabetic persons in the general population and residing in nursing homes by race, sex, and age by category of care. Similar data is provided for the source of payment of expenditures. The 1987 expenditures were adjusted to reflect the impact of inflation from 1987 to 1994 using the Consumer Price Index for medical care from the Bureau of Labor Statistics. The utilization rate for each type of health care service is shown for diabetic and nondiabetic persons. The mean expenditure is calculated for the entire population, rather than just those that utilize health care.

The data set includes one young black male with diabetes who incurred enormous medical expenses. Estimates for that demographic cell were greatly affected, in part because of the small number of persons in this particular demographic cell. We excluded the data on this person when estimating specific race, age and sex data, but included the individual in total estimates of expenditures. Also, the number of black men with diabetes, aged 65 years and older was small, so unreliable estimates for this particular race, sex, and age cell are unreliable. These estimates are provided in the tables, but will not be discussed in the discussion section.

The major costs of diabetes are incurred due to the complications of diabetes: cardiovascular disease, eye disease, renal disease, and lower extremity disease. All persons

with one or more specified ICD-9-CM codes were identified as having the complication. Appendix A provides the codes used for each condition. The ratio of the frequency (prevalence) of the condition in diabetic to nondiabetic persons is the relative risk; the absolute difference between the two rates is the attributable risk. All costs associated with medical encounters identified with the complication code were assigned to that complication. The costs attributable to that complication was calculated by summing the expenditures for all visits associated with the complication code. The cost attributable to diabetes is the excess costs incurred for care for the particular complication. The nondiabetic prevalence rate of the condition was multiplied by the diabetic population to obtain an estimate of the background or general population rates of the condition. The number of persons with the condition were then multiplied by the mean costs for the nondiabetic population with that condition to obtain the expected costs of the condition. This amount was subtracted from the total costs of care for the condition in the diabetic population to obtain the excess costs that could be attributed to diabetes. The estimated costs of care for complications due to diabetes cannot be summed to provide the total excess burden of diabetes because encounters with multiple diagnosis codes had the entire amount credited to each condition.

The indirect costs were defined as lost earnings. Lost earnings occurred through two mechanisms: either through inability to participate in the workforce due to illness or disability, or via days lost from work due to illness. The NMES-2 provided the number of persons who reported on 2 or more quarterly reports that they were out of the work force secondary to illness or disability. This number of persons was then multiplied by the mean income for that race, sex, and age group from the NMES-2 data set. Earnings lost to sick days were also included, but represented less than 1 percent of the overall loss of earnings.

All expenditures and earnings estimates from the 1987 NMES-2 were adjusted to 1994 using the US Department of Labor rates of inflation for medical care costs and wages.

RESULTS

Prevalence Estimates

Table 1 compares the diabetes prevalence estimates obtained from the 1987 NMES-2 and the estimates based upon the National Health Interview Survey (NHIS) for 1987 and 1993. (Estimates for 1994 were not yet available). The prevalence estimates obtained from NMES are frequently slightly less than those from the NHIS. However, the estimates for the black population in both surveys are based on very small numbers and fluctuate greatly. Data on older black males is included in the tables, but will not be discussed further due to the unreliability of these estimates.

Population estimates

Using NMES-2 prevalence rates, we estimate that there were 136,463 persons with known diabetes using the health care system in Indiana in 1994, and an estimated 3,059,069

persons without diabetes. The breakdown by race, sex, and age are shown in Table 2A.

Expenditures by type and source of payment

In Table 2A the mean and total expenditures for all medical care excluding nursing home care are shown by race, sex and age group. The mean expenditure per person with diabetes was greater for each demographic group than for persons without diabetes. Estimated expenditures for persons with diabetes totaled almost \$1.4 billion dollars compared to \$9.0 billion for persons without diabetes. Persons with diabetes comprised 4.3% of the population in Indiana, but consumed 13% of the health care expenditures.

In Table 2B-2J, estimated expenditures are provided for each type of care by age, sex, race and diabetes status. The percent of the population using each type of service is shown in the first two columns. The mean expenditure per year is calculated using the total diabetic or nondiabetic population as the denominator, rather than just those who utilized that specific form of medical care. The last two columns estimate the total expenditures for the service for each demographic cell. The expenditures include office visits (Table 2B), outpatient services (Table 2C), emergency care (Table 2D), prescription medications (Table 2E), inpatient care (Table 2F), and nursing home care (Table 2G). Persons with diabetes were more likely to utilize all forms of care.

Expenditures for medical care were higher for persons with diabetes for every category of medical care across all age, sex, and race categories. The mean expenditure for office visits was \$846 vs \$452, for outpatient services was \$747 vs \$342, and for emergency care was \$122 vs \$58. The estimated expenditures for prescription medications was \$657 vs \$183, inpatient care \$4,535 vs \$1584. The mean expenditure per person for nursing home care was \$1112 vs \$331. (This is per person, rather than per nursing home resident). Persons with diabetes were more likely to be residing in a nursing home in every demographic group. Table 2H provides a summary of expenditures by type of care and diabetes status

Sources of Payment for Medical Expenditures

In Table 3A-3D, the estimated expenditures are shown by source of payment for each type of medical care and race, by sex, age, and diabetes status. Sources of payment were categorized as out-of-pocket, private insurance, Medicare, and Medicaid. Medicare covered expenditures primarily for the elderly inpatient and office visits, with no coverage for prescription medications and little coverage for nursing home care. Blacks were more likely to have Medicaid coverage for expenditures in all age and sex groups. In every demographic category, persons with diabetes used more Medicaid coverage than those without diabetes. Table 3E and 3F shows the mean and total estimated expenditures for Whites and Blacks by source of payment, sex, and age.

Costs of Care Attributable to Diabetes Complications

The percent of diabetic and nondiabetic persons with medical conditions known to be complications of diabetes are shown in Table 4. These conditions include hypertension, cardiovascular disease, cerebrovascular disease, lower extremity disease, eye disease, and nephropathy. Breakdowns by age and sex are provided when sufficient numbers were available for reliable estimates. The relative risk and attributable risk are also shown, along with the estimated expenditures for care for that condition. The last column displays the costs attributable to diabetes for the care for each complication. The costs attributable to diabetes for hypertension care was \$25 million, for cardiovascular disease, \$59 million, cerebrovascular disease, \$20 million. Costs attributable to diabetes for nephropathy complications were \$5 million, for lower extremity conditions \$20 million, and for diabetic eye disease \$16 million.

The attributable costs due to diabetes for the various health conditions should not be summed. Many visits had multiple coding, and thus the costs were counted more than once.

Indirect Costs of Diabetes

The indirect costs of diabetes are shown in Table 5. The percent of persons out of the labor force, defined as a person who was out of the work force for more than six months in a year due to illness or disability is shown in the first two columns. In every race, sex, and age category, persons with diabetes are significantly more likely to report being disabled. The mean loss of earnings and totals are shown in the last four columns. The total loss of earnings in persons with diabetes were approximately \$756 thousand compared to \$6011 thousand for the nondiabetic population.

DISCUSSION

There were an estimated 136,463 persons with known diabetes using the health care system in Indiana in 1994, and an estimated 3,059,069 persons without diabetes. Persons with diabetes represented 4.3% of the Indiana State population. The estimated prevalence of diabetes is higher than the national estimates of 3.1 percent, in part due to the older age of Indiana residents. The actual prevalence of diagnosed diabetes may be even higher in each age/sex/race grouping, due to the high rate of obesity in Indiana, a known risk factor for diabetes. Better information on the true prevalence of diabetes, both diagnosed, and undiagnosed, would be useful for ongoing public health efforts.

Although only 4.3% of the population in Indiana were estimated to have diabetes, almost 13% of the health care expenditures were made for the care of persons with diabetes. The majority of these medical care costs are incurred for the care of various medical complications such as diabetic eye disease, cardiovascular disease, renal disease, and disease of the lower extremity. Persons with diabetes were more likely to utilize all forms of medical care, and to incur higher costs of care for various medical conditions than persons without diabetes. Over half of the costs were due to inpatient care. Thus, any efforts to reduce the rate of acute or chronic complications that require hospitalization may provide major reductions in the costs of care for persons with diabetes.

The costs of care for diabetes are primarily incurred through the costs for complications to the eye, kidney, heart, and feet. Because these conditions also occur in the general population, the increase in disease and costs due to diabetes are difficult to identify. We have attempted to provide some estimates of the costs of various types of care that can be attributed to diabetes. This information can inform public policy decisions by identifying the relative contribution of each complication to the overall costs of medical care for persons with diabetes. The attributable costs, along with information on the effectiveness of various medical interventions can then be used to identify the most effective strategies to reduce morbidity, mortality, and the costs of medical care.

For example, we already know effective strategies to prevent or delay several of these diabetes-related conditions. Adequate identification and control of hypertension could significantly reduce the rate of nephropathy. Screening and treatment of persons with diabetic eye disease could reduce the costs associated with disability due to eye disease. Lower extremity disease, including ulcers and amputations, could be significantly decreased with low-cost interventions of appropriate foot wear and education. Efforts to reduce the acute complications that result in hospitalizations, such as ketoacidosis, could be cost-effective and improve the quality of life.

The value of public health interventions for other diabetes-related conditions is less clear cut. The value of glycemic control, lipid reduction, and hypertension control to prevent cardiovascular disease for persons with NIDDM remains controversial. Unfortunately, this is one of the most prevalent and costly complications of diabetes. The lack of evidence for efficacy of treatment, combined with the moderate attributable costs due to macrovascular disease make this condition a less favorable target for public health interventions. In particular, the possible gains due to aggressive treatment may be marginal in older populations.

The costs of diabetes encompass not only the direct costs for medical care, but also the indirect costs incurred due to the disability caused by the many complications. The NMES-2 data set did not identify which medical condition caused the disability, so we were unable to directly link diabetes with the disability. However, the rates of disability were at least two-fold higher for persons with diabetes as compared to those without, in every age/sex/race group, emphasizing the relationship of diabetes and disability. Twenty-five percent of the diabetic population reported that they were out of the workforce due to disability or illness, as compared to seven percent of the persons without diabetes, underscoring the fact that persons with diabetes experience extensive economic loss. The impact of this economic insult is seen in the higher use of Medicaid coverage in every age and sex group.

In summary, diabetes is associated with higher rates of utilization and costs of care. It is also associated with high rates of disability and higher loss of earnings due to illness and disability. Persons with diabetes use more Medicaid and Medicare at a higher rate to reimburse medical care expenditures. Public health measures must take both the effectiveness, prevalence, and costs of complications into account in designing interventions.

Appendix A
Diagnosis Categories with Corresponding ICD-9 Codes
(International Classification of Diseases 9th Revision)

Diagnosis Category	ICD-9 Codes
Eye disease	
Diabetic retinopathy	250.5x, 362.0x
Glaucoma	365
Cataracts	366
Blindness	369
Hypertension	401-405
Cardiovascular disease	410-414, 428, 429.2, 429.3 & 429.9
Cerebrovascular disease	430-438
Foot Disease	
Diabetes with peripheral vascular disease	250.7x, 443.81
Peripheral vascular disease	440, 443, 459.8, 459.9
Chronic skin ulcers	707
Nephropathy	580-586, 593.9
Diabetes with renal disease	250.4x

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Table 1

Diabetes Prevalence Estimates from the 1987 National Medical Expenditures (NMES-2) and National Health Interview Survey (NHIS)* by Race, Sex, and Age

Demographic Group	1987 NMES-2 (%)	NHIS, 1987 (%)	NHIS, 1993 (%)
White males, 0-44 yrs	0.4	0.6	0.7
White males, 45-64 yrs	4.9	5.6	5.8
White males, 65-74 yrs	11.2	9.0	10.0
White males, 75+ yrs	9.7	10.4	10.5
White females, 0-44 yrs	0.6	0.7	0.7
White females, 45-64 yrs	4.7	4.8	5.2
White females, 65-74 yrs	10.1	8.6	10.1
White females, 75+ yrs	8.9	8.1	9.8
Black males, 0-44 yrs	0.7	0.8	0.8
Black males, 45-64 yrs	10.2	10.1	8.3
Black males, 65-74 yrs	12.8	16.1	23.3
Black males, 75+ yrs	12.1	10.4	6.0
Black females, 0-44 yrs	1.0	0.9	1.3
Black females, 45-64 yrs	12.2	11.0	10.9
Black females, 65-74 yrs	20.1	16.3	17.2
Black females, 75+ yrs	14.7	24.7	20.0

* Estimate is based on a three year moving average. Estimates obtained from the Centers for Disease Control, Diabetes Control Division

Table 2A
Total Estimated Expenditures for Medical Care by Diabetes Status, Race, Sex, and Age
Indiana, 1994

	Total Population		Mean Expenditure per Person (\$)		Total Expenditures (\$ in thousands)	
	DM	nonDM	DM	nonDM	DM	nonDM
White Male, 25-64	28,517	1,222,222	9,317	1,649	265,696	2,015,942
White Female, 25-64	27,218	1,040,166	7,131	2,151	194,103	2,237,048
Black Male, 25-64	4,190	86,893	13,039	2,224	54,630	193,222
Black Female, 25-64	5,173	88,199	9,783	2,574	50,606	226,994
White Male, 65+	27,368	230,335	8,984	6,984	245,863	1,608,708
White Female, 65+	37,948	359,412	12,799	6,951	485,687	2,498,268
Black Male, 65+*	1,887	13,145	7,149	8,341	13,487	109,644
Black Female, 65+	4,163	18,696	13,719	7,226	57,107	135,095
Total	136,463	3,059,069	10,019	2,950	1,367,178	9,024,922

Source: NMES-2, 1987

* Estimates unreliable due to small sample

Table 2B
Estimated Expenditures for Office Visits by Diabetes Status, Race, Sex, and Age
Indiana, 1994

	Percent with Office Visits (%)		Mean Expenditure per Person for Office Visits (\$)		Total Expenditures for Office Visits (\$ in thousands)	
	DM	nonDM	DM	nonDM	DM	nonDM
White Male, 25-64	97	64	868	340	24,758	415,686
White Female, 25-64	95	81	855	510	23,261	530,164
Black Male, 25-64	80	48	596	293	2,498	25,499
Black Female, 25-64	92	67	657	347	3,400	30,644
White Male, 65+	91	79	799	638	21,880	146,855
White Female, 65+	86	80	911	611	34,559	219,498
Black Male, 65+*	82	58	429	348	810	4,576
Black Female, 65+	87	72	1,013	485	4,217	9,068
Total	91	72	846	452	115,384	1,381,989

Source: 1987 NMES-2

* Estimates unreliable due to small sample

Table 2C
Estimated Expenditures for Outpatient Services# by Diabetes Status, Race, Sex, and Age
Indiana, 1994

	Percent with Outpatient Services (%)		Mean Expenditure per Person for Outpatient Services (\$)		Total Expenditures for Outpatient Services (\$ in thousands)	
	DM	nonDM	DM	nonDM	DM	nonDM
White Male, 25-64	30	14	524	242	14,931	295,968
White Female, 25-64	38	22	559	297	15,222	309,324
Black Male, 25-64	47	16	1,068	304	4,474	26,433
Black Female, 25-64	45	22	1,188	323	6,148	28,480
White Male, 65+*	39	28	710	768	19,429	176,828
White Female, 65+	33	28	894	532	33,932	191,067
Black Male, 65+	42	28	1,809	553	3,413	7,265
Black Female, 65+	41	26	1,064	560	4,431	10,466
Total	37	20	747	342	101,979	1,045,831

Hospital ambulatory services (e.g. dialysis, physical therapy, laboratory tests), excluding emergency services

* Estimates unreliable due to small sample

Source: 1987 NMES-2

Table 2D
Estimated Expenditures for Emergency Care by Diabetes Status, Race, Sex, and Age
Indiana, 1994

	Percent with Emergency Care Visits		Mean Expenditure per Person for Emergency Care		Total Expenditures for Emergency Care (\$ in thousands)	
	DM	nonDM	DM	nonDM	DM	nonDM
White Male, 25-64	19	13	91	51	2,581	62,459
White Female, 25-64	24	14	113	60	3,071	62,900
Black Male, 25-64	33	18	94	91	393	7,872
Black Female, 25-64	37	21	170	83	877	7,316
White Male, 65+	23	16	129	53	3,533	12,268
White Female, 65+	26	17	145	64	5,487	23,014
Black Male, 65+*	34	19	144	79	272	1,037
Black Female, 65+	34	17	104	65	433	1,221
Total	25	14	122	58	16,647	178,087

Source: 1987 NMES-2

* Estimates unreliable due to small sample

Table 2E
Estimated Expenditures for Prescription Medications by Diabetes Status, Race, Sex, and Age
Indiana, 1994

	Percent with Prescription Medications (%)		Mean Expenditure per Person for Prescription Medications (\$)		Total Expenditures for Prescription Medication (\$ in thousands)	
	DM	nonDM	DM	nonDM	DM	nonDM
White Male, 25-64	87	45	552	115	15,743	140,569
White Female, 25-64	93	64	673	168	18,331	174,664
Black Male, 25-64	91	37	551	96	2,310	8,335
Black Female, 25-64	94	56	642	132	3,319	11,619
White Male, 65+	92	72	682	344	186	79,239
White Female, 65+	85	74	722	379	2,739	136,083
Black Male, 65+*	84	64	402	259	758	3,404
Black Female, 65+	90	73	762	350	3,172	6,538
Total	89	58	657	183	89,683	560,451

Source: 1987 NMES-2

* Estimates unreliable due to small sample

Table 2F
Estimated Expenditures for Inpatient Care by Diabetes Status, Race, Sex, and Age
Indiana, 1994

	Percent with Inpatient Care (%)		Mean Expenditure per Person for Inpatient Care (\$)		Total Expenditures for Inpatient Care (\$ in thousands)	
	DM	nonDM	DM	nonDM	DM	nonDM
White Male, 25-64	27	6	7,165	861	204,331	1,052,108
White Female, 25-64	26	12	4,756	1,073	129,457	1,116,360
Black Male, 25-64	41	10	10,444	1,404	43,759	121,972
Black Female, 25-64	33	12	6,793	1,657	35,140	146,146
White Male, 65+	25	22	5,456	4,304	149,311	991,369
White Female, 65+	30	18	7,507	3,486	284,858	1,252,850
Black Male, 65+*	34	21	2,991	6,027	5,642	79,229
Black Female, 65+	35	17	9,433	4,522	39,267	84,551
Total	29	11	6,535	1,584	891,765	4,844,584

Source: 1987 NMES-2

* Estimates unreliable due to small sample

Table 2G
Estimated Expenditures for Nursing Home Care by Diabetes Status, Race, Sex, and Age
Indiana, 1994

	Percent of DM in a Nursing Home	Percent of nonDM in a Nursing Home	Mean Expenditure per person for Nursing Home Care (\$)		Total Expenditures for Nursing Home Care (\$ in thousands)	
			DM	nonDM	DM	nonDM
White Male, 25-64	0.6	0.2	118	40	3,352	49,152
White Female, 25-64	0.8	0.2	175	42	4,760	43,636
Black Male, 25-64	1.0	0.2	286	36	1,196	3,111
Black Female, 25-64	1.2	0.2	333	32	1,722	2,789
White Male, 65+	5.8	4.5	1,208	878	33,054	202,151
White Female, 65+	11.0	8.1	2,621	1,880	99,456	675,756
Black Male, 65+*	7.4	4.4	1,374	1,075	2,592	14,134
Black Female, 65+	6.4	5.3	1,342	1,244	5,587	23,251
Total	4.6	1.4	1,112	331	151,720	1,013,980

Source: 1987 NMES-2

* Estimates unreliable due to small sample

Table 2H
Estimated Expenditures by Type of Care and Diabetes Status
Indiana, 1994

	Mean Expenditures per Person		Total Expenditures	
	DM (\$)	nonDM (\$)	DM (\$ in thousands)	nonDM (\$ in thousands)
Office Visits	846	452	115	1,381
Outpatient Services	747	342	102	1,046
Emergency Care	122	58	17	178
Prescription Medications	657	183	90	560
Inpatient Care	6,535	1584	892	4,845
Nursing Home Care	1,112	331	152	1,014
Total	10,019	2,950	1367	9025

Source: 1987 NMES-2

Table 3A
Estimated Expenditures for Office Visits, Prescription Medications, and Outpatient Care
for Whites by Sex, Age, Diabetes Status, and Source of Payment (\$)

	Office Visits		Prescribed Medications		Outpatient Care	
	DM	NonDM	DM	NonDM	DM	NonDM
White Male, 25-64						
Out of Pocket	240	120	272	57	87	27
Private Insurance	472	145	202	41	275	134
Medicare	30	9	0	0	8	6
Medicaid	20	15	20	6	4	10
White Female, 25-64						
Out of Pocket	291	211	305	91	78	47
Private Insurance	355	240	233	59	170	175
Medicare	53	5	0	0	78	8
Medicaid	104	26	101	13	91	19
White Male, 65+						
Out of Pocket	336	223	398	215	79	178
Private Insurance	145	92	190	93	93	106
Medicare	269	277	0	0	330	263
Medicaid	13	5	27	12	22	5
White Female, 65+						
Out of Pocket	310	245	428	255	125	78
Private Insurance	89	86	179	81	154	75
Medicare	430	257	0	0	407	286
Medicaid	27	18	70	29	13	17

Source: 1987 NMES-2

Table 3B
Estimated Expenditures for Office Visits, Prescription Medications, and Outpatient Care
for Blacks by Sex, Age, Diabetes Status, and Source of Payment (\$)

	Office Visits		Prescribed Medications		Outpatient Care	
	DM	NonDM	DM	NonDM	DM	NonDM
Black Male, 25-64						
Out of Pocket	144	66	258	44	46	41
Private Insurance	251	123	66	15	150	89
Medicare	40	16	0	0	113	4
Medicaid	77	33	201	24	137	46
Black Female, 25-64						
Out of Pocket	168	88	314	67	121	23
Private Insurance	160	128	87	21	136	130
Medicare	86	10	0	0	565	17
Medicaid	216	84	224	39	279	65
Black Male, 65+*						
Out of Pocket	164	113	202	147	14	83
Private Insurance	61	58	58	12	46	42
Medicare	151	141	0	0	283	220
Medicaid	12	16	94	41	32	18
Black Female, 65+						
Out of Pocket	371	99	362	174	240	45
Private Insurance	47	24	127	32	16	38
Medicare	451	254	0	0	600	332
Medicaid	105	88	255	137	130	53

Source: 1987 NMES-2

* Estimates unreliable due to small sample

Table 3C
Estimated Expenditures for Inpatient Care, Emergency Care, and Nursing Home Care by
for Whites by Sex, Age, Diabetes Status, and Source of Payment (\$)

	Inpatient Care		Emergency Care		Nursing Home Care	
	DM	NonDM	DM	NonDM	DM	NonDM
White Male, 25-64						
Out of Pocket	423	113	15	11	61	8
Private Insurance	2,839	487	37	28	8	2
Medicare	179	61	1	1	4	0
Medicaid	34	39	0	1	28	24
White Female, 25-64						
Out of Pocket	247	118	14	12	36	13
Private Insurance	2,112	724	45	30	0	1
Medicare	653	45	4	2	3	0
Medicaid	1,228	89	43	8	134	25
White Male, 65+						
Out of Pocket	252	392	13	7	542	481
Private Insurance	1,019	838	14	9	2	9
Medicare	2,866	2,502	77	29	24	20
Medicaid	16	12	9	1	596	314
White Female, 65+						
Out of Pocket	533	284	28	9	1,055	986
Private Insurance	1,371	646	41	9	22	21
Medicare	4,851	2,168	62	34	42	32
Medicaid	82	85	4	2	1,472	796

Source: 1987 NMES-2

Table 3D
Estimated Expenditures for Inpatient Care, Emergency Care, and Nursing Home Care
for Blacks by Sex, Age, Diabetes Status, and Source of Payment (\$)

	Inpatient Care		Emergency Care		Nursing Home Care	
	DM	NonDM	DM	NonDM	DM	NonDM
Black Male, 25-64						
Out of Pocket	486	118	6	9	44	4
Private Insurance	4,127	428	35	30	6	0
Medicare	2,006	127	17	5	0	0
Medicaid	1,204	265	3	26	225	27
Black Female, 25-64						
Out of Pocket	341	215	12	16	16	6
Private Insurance	1,136	630	37	26	22	0
Medicare	467	79	29	1	0	0
Medicaid	2,902	535	67	28	276	23
Black Male, 65+*						
Out of Pocket	41	276	26	18	288	217
Private Insurance	496	1,752	8	7	30	0
Medicare	2,030	2,705	85	40	30	16
Medicaid	50	72	11	5	951	793
Black Female, 65+						
Out of Pocket	374	204	10	2	176	237
Private Insurance	836	167	6	0	0	2
Medicare	6,662	3,215	64	45	0	24
Medicaid	567	189	19	12	1,123	933

Source: 1987 NMES-2

* Estimates unreliable due to small sample

Table 3E
Mean and Total Estimated Expenditures for Medical Care
for Whites by Sex, Age, and Source of Payment
Indiana, 1994

	Mean Expenditures		Total Expenditures	
	DM (\$)	NonDM (\$)	DM (\$ in thousands)	NonDM (\$ in thousands)
White Male, 25-64				
Out of Pocket	1,098	335	31,298	409,216
Private Insurance	3,833	837	109,297	1,023,485
Medicare	221	77	6,295	94,033
Medicaid	105	95	2,997	116,039
White Female, 25-64				
Out of Pocket	970	494	26,413	513,497
Private Insurance	2,916	1,229	79,357	1,278,216
Medicare	791	60	21,522	62,546
Medicaid	1,701	180	46,293	187,641
White Male, 65+				
Out of Pocket	1,620	1,496	44,326	344,635
Private Insurance	1,463	1,147	40,050	264,307
Medicare	3,565	3,092	97,576	712,085
Medicaid	683	349	18,685	80,270
White Female, 65+				
Out of Pocket	2,476	1,837	93,943	660,100
Private Insurance	1,857	919	70,482	330,129
Medicare	5,792	2,777	219,808	998,199
Medicaid	1,667	947	63,268	340,283

Source: 1987 NMES-2

Table 3F
Mean and Total Expenditures for Medical Care Expenditures
for Blacks by Sex, Age, and Source of Payment
Indiana, 1994

	Mean Expenditures		Total Expenditures	
	DM (\$)	NonDM (\$)	DM (\$ in thousands)	NonDM (\$ in thousands)
Black Male, 25-64				
Out of Pocket	984	264	4,123	22,944
Private Insurance	4,636	685	19,426	59,523
Medicare	2,176	152	9,119	13,212
Medicaid	1,848	421	7,742	36,621
Black Female, 25-64				
Out of Pocket	972	432	5,030	38,104
Private Insurance	1,578	933	8,162	82,321
Medicare	1,148	107	5,938	9,444
Medicaid	3,963	773	20,498	68,213
Black Male, 65+ *				
Out of Pocket	735	854	1,386	11,225
Private Insurance	700	1,871	1,320	24,599
Medicare	2,579	3,121	4,864	41,027
Medicaid	1,149	944	2,168	12,408
Black Female, 65+ *				
Out of Pocket	1,532	761	6,376	14,221
Private Insurance	1,033	263	4,298	4,909
Medicare	7,777	3,870	32,374	72,358
Medicaid	2,199	1,412	9,155	26,390

Source: 1987 NMES-2

* Estimates unreliable due to small sample

Table 4
Estimated Costs of Care for Various Diabetes Complications
and Attributable to Diabetes, Indiana State, 1994

Condition	Prevalence (%)		Relative Risk	Attributable Risk (per 100)	Total Expenditure (\$ in thousands)		Cost Attributable to Diabetes (\$ in thousands)
	DM	nonDM			DM	nonDM	
Hypertension							
Male, 25-64 yrs	37.0	9.0	3.9	27.5	8,793	76,737	6,876
Female, 25-64 yrs	44.5	10.5	4.3	34.0	10,490	73,825	8,370
Male, 65+ yrs	39.5	27.4	1.4	12.1	8,412	41,724	3,399
Female, 65+ yrs	52.6	36.3	1.5	16.3	16,134	85,754	6,584
Nephropathy							
25-64 yrs	0.6	0.2	3.1	0.4	3,103	48,462	1,809
65+ yrs	2.5	0.9	2.7	1.6	12,931	52,624	4,065
Cerebrovascular Dz							
25-64 yrs	1.2	0.2	7.2	1.0	7,616	30,472	6,802
65+ yrs	4.6	3.6	1.3	1.1	33,481	172,754	13,647
Cardiovascular disease							
Male, 25-64 yrs	8.4	1.5	5.7	6.9	16,627	122,844	13,558
Female, 25-64 yrs	7.8	0.8	9.8	7.0	15,327	56,990	13,691
Male, 65+ yrs	14.9	11.1	1.3	3.8	26,260	170,165	5,814
Female, 65+ yrs	19.5	9.0	2.2	10.5	49,493	214,478	25,606
Eye disease							
25-64 yrs	5.0	0.7	6.2	3.8	7,342	35,763	6,387
65+ yrs	14.7	11.2	1.3	3.5	25,784	137,230	10,029
Lower extremity disease							
Male 25-64 yrs	4.0	2.0	2.4	2.2	3,317	49,432	2,082
Female 25-64 yrs	9.1	1.6	5.8	0.1	7,966	43,340	6,722
Male 65+ yrs	16.2	7.5	2.2	8.8	12,788	44,416	7,451
Female 65+ yrs	10.1	7.1	1.4	3.0	11,443	65,768	4,118

Source: 1987 NMES-2

Table 5
Lost Earnings Due to Illness or Disability
by Diabetes Status, Race, Sex, and Age
Indiana, 1994

	Percent Out of the Labor Force due to Illness or Disability (%)		Lost Earnings, Mean (\$)		Lost Earnings, Total (\$ in thousands)	
	DM	NonDM	DM	NonD M	DM	NonDM
White Male, 25-64	20	5	8,204	2,444	233,941	2,987,109
White Female, 25-64	30	5	6,678	1,239	181,773	1,289,113
White Male, 65+	13	9	3,543	2,151	96,975	495,458
White Female, 65+	23	10	3,273	1,572	124,203	564,923
Black Male, 25-64	48	13	14,982	4,031	62,770	350,227
Black Female, 25-64	39	9	9,676	2,266	50,051	199,890
Black Male, 65+	25	22	2,912	3,851	5,494	50,619
Black Female, 65+	46	25	3,261	2,982	1,375	55,744
Total	25	7	5,544	1,949	756,582	5,993,083

Source: 1987 NMES-2